

MAX 4U- the first fourth-generation lightsource upgrade

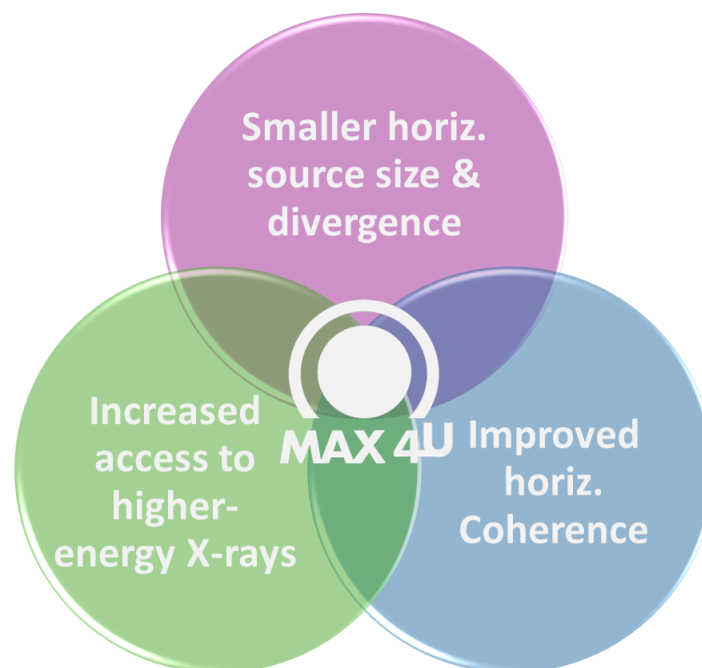
Aymeric Robert (presenting author underscored), Balasubramanian Thiagarajan, Dean Lang, Kajsa Sigfridsson Klauss, Kim Nygård, and Robert Temperton

MAX IV Laboratory, Lund, Sweden

In 2016, MAX IV inaugurated the world's first fourth-generation storage ring. With unprecedented performance, this new accelerator paved the way for a new era of X-ray science. Currently, four more fourth-generation light sources are in operation, with many more to come online by 2040. Overall, the accelerator community is making considerable advancements in Multi-Bend Achromat (MBA)-type lattices. This is to such an extent that, whereas MAX IV paved the way for fourth-generation light sources, we will have difficulties competing with other synchrotrons in the future.

With this in mind, we developed our vision for the laboratory to strengthen our beamline capabilities and ensure the excellence, relevance, resilience, and leadership of Swedish academic and industrial research with X-rays for the next decades.

This is MAX 4U, and is our proposal to upgrade our 3 GeV storage ring [1]. MAX 4U will further reduce the 3 GeV ring horizontal emittance from the current 328 pm·rad to better than 75 pm·rad on the horizon of the early 2030s [2]. Beyond an accelerator upgrade, MAX 4U offers opportunities to improve beamline performance, keeping MAX IV a leading platform for accelerating science, discovery, and innovation.



[1] A. Robert et al., Eur. Phys. J. Plus 138, 495 (2023)

[2] <https://maxiv.lu.se/max4u>